

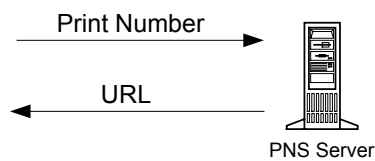
An Idea of Internet Printing

1. Introduction

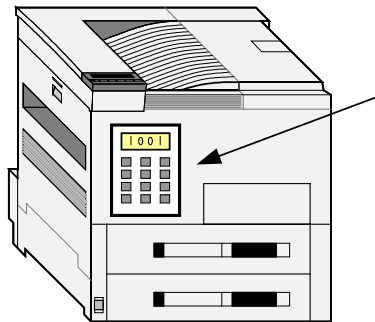
With introducing Print Number System in the Internet Printing, people can use network printers to print documents on the Internet without the needs of personal computers.

Print Number (PN) – A numeric string (e.g. 8888,0001, like phone number) represents the URL of a document.

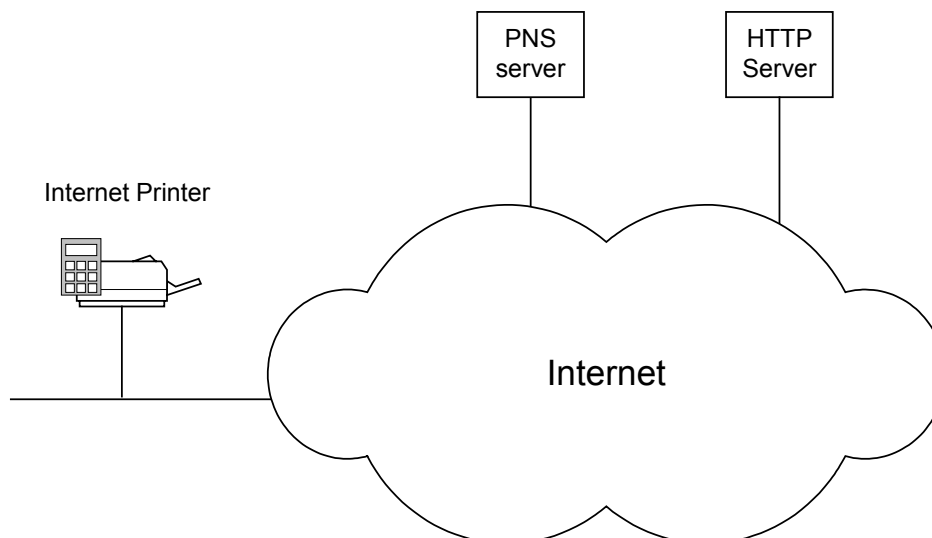
Print Number System (PNS) – A server's service that translates print numbers into URLs for all Internet printers.



Internet Printer – A network printer or MFP with a built-in keypad for the user to enter PN, and enhanced communication capabilities to access PNS and HTTP server.



2. How it Work



Using URL and Print Number (PN), the method for users to print documents includes:

For information providers: Document→URL→PNS→PN

1. Use URLs to describe how to retrieve documents on the Internet (HTTP server)
2. Store the URLs in Print Number System (PNS server), and represent the URLs as PNs

For users who retrieves Information, at the printer: PN→PNS→URL→Doc→Printer

1. The user enters a PN on the keypad of Internet printer;
2. The printer sends the PN to PNS server;
3. PNS server translates the PN into a URL, and returns the URL to the printer;
4. According to the URL, the printer retrieves document from HTTP server and prints the document.

Formulization

Information Provider: **Doc → URL → PNS → PN**

Information Retriever: **PN → PNS → URL → Doc → Printer**

3. CASE STUDIES

Case Studies

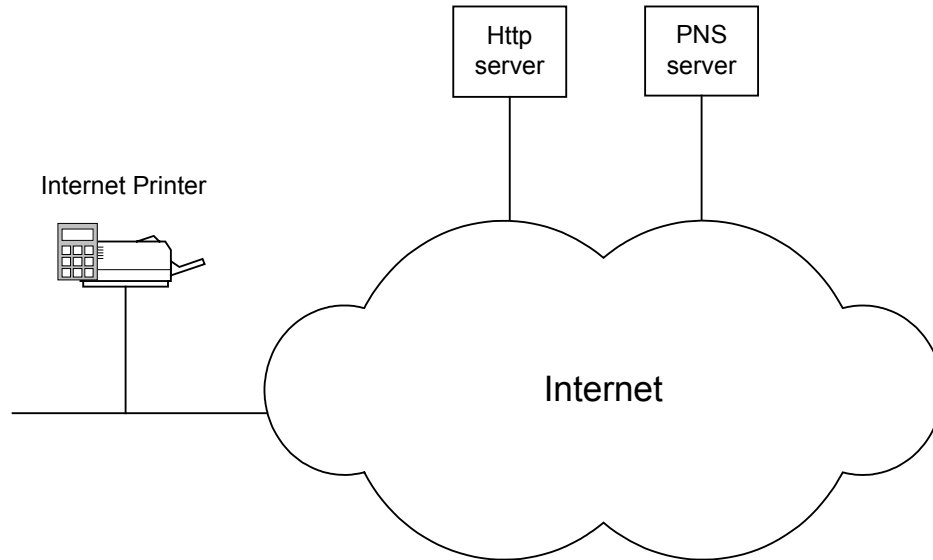
1. Printing of the Advertisement
2. Public Printing for People Who Do Not Have Their Own Printers
3. Account Statement Printing of the Bank and Corporation
4. Printing of the Health Information

Users

- Anyone, personnel, worker, customer, even child, senior, and person who never use computer
- Home users, who may not have computers, but do have Internet printers at homes

Case Study 1: Printing of the Advertisement and Document

The user (Alice, a personnel of a Bank) prepares an advertisement of a credit card to be published in the newspaper, and an application form for the public to apply the card. Due to the cost, the Bank decides not to publish the application form in the newspaper but to let the public print.



For the Bank (**Application Form → URL → PN**)

1. Alice prints the application form into a printable file in her computer, stores the printable file in a web server of the bank, and uses a URL to describe where to get the file on the Internet
2. In PNS server, Alice registers the URL and receives a PN (e.g. 8888-0001) of the URL
3. The advertisement is published in the newspaper with *Application Form PN (8888-0001)*

For the Public at the Printers Worldwide (**PN → URL → Download → Printer**)

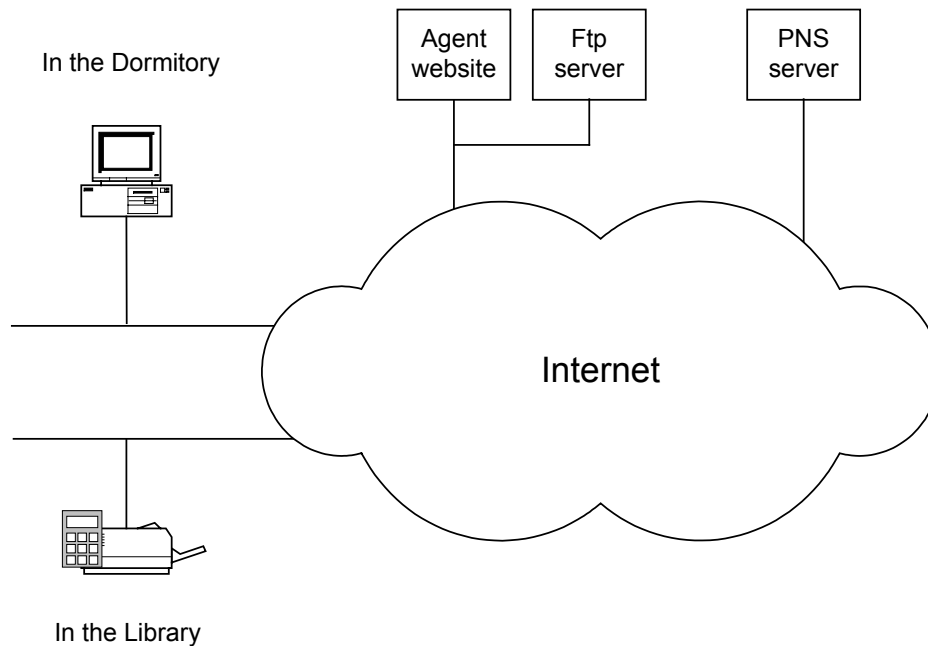
1. In the newspaper, somebody (Bob) reads the ad and wants to apply the card
2. In his office, Bob keys in the PN (8888-0001) on the keypad of the printer
3. The printer sends the PN to PNS server, and requests for the URL of the PN
4. PNS maps the PN to the URL of the printable file of application form, and returns the URL to the printer
5. The printer executes the URL, downloads and prints out the application forms

Benefits:

- The users do not need to power-up computers and browse the Internet, anyone can operate in the printer like in the phone set, by just keying in numbers.
- Print documents and forms on demand.

Case Study 2: Public Printing for Students and People Who Do Not Have Their Own Printers

The user (Candy, a university's student) writes a paper using her computer, and wants to print it out with a laser printer, but she has no personal laser printer in her dormitory. However, she knows that the print shop and school library do have public laser printers.



In the Dormitory

1. Candy prepares (prints) her paper into a printable file
2. Candy views the web page of an agent website, and uploads the printable file to the website
3. The website assigns a PN e.g. 8888-0002 to Candy
4. The website stores the file in the Ftp server. And in PNS server, the website registers the URL of the file, and PN e.g. 8888-0002 represents the URL

In the School Library

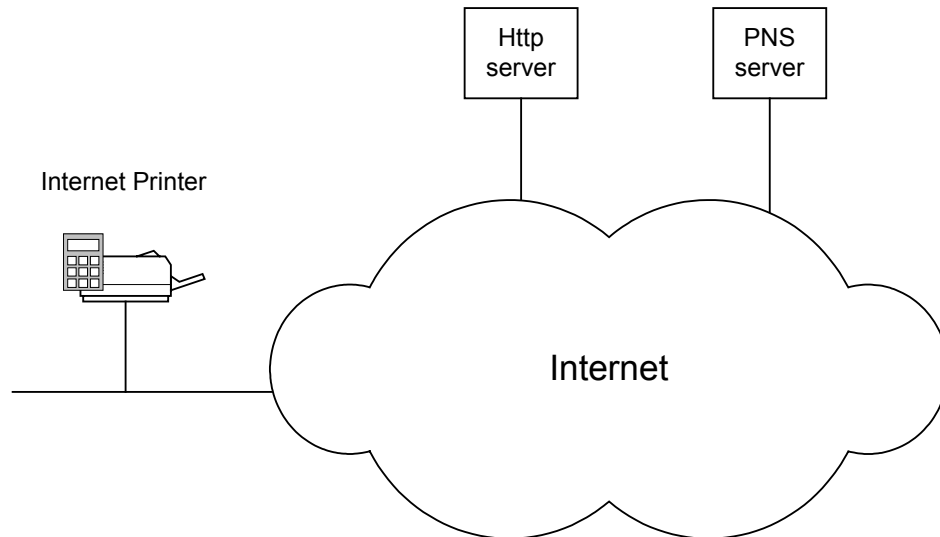
1. Candy keys in PN (8888-0002) on the keypad of a laser printer
2. The printer sends the PN to PNS server
3. PNS server maps the PN to the URL of the printable file of Candy's paper, and sends back the URL to the printer
4. The printer executes the URL, downloads and prints out the Candy's paper

Benefit:

- Students and anyone who do not have printers or prefer to use high-end printers
- Travelers do not need to carry hardcopies of documents, and instead print-on-demand worldwide just with a print number
- Not necessary to have own websites to host documents.

Case Study 3: Account Statement Printing of the Bank and Corporation

The user (Don, a bank account holder) wants to print his bank statement from his office/home printer.



For the Bank

1. In PNS server, the bank registers a series of account number as the PN, and assigns the URL of accessing bank statement to the PN

For the Public

1. Don enters his account number on the keypad of the printer
2. The printer sends the account number to PNS server, and requests for the related URL
3. PNS server sends back the URL of accessing bank statement to the printer
4. The printer prompts Don for his account password, and Don enters on the keypad
5. With the URL and password, the printer sends a http request to bank server
6. Bank server produces the statement, and sends back to the printer
7. Don's statement is printed

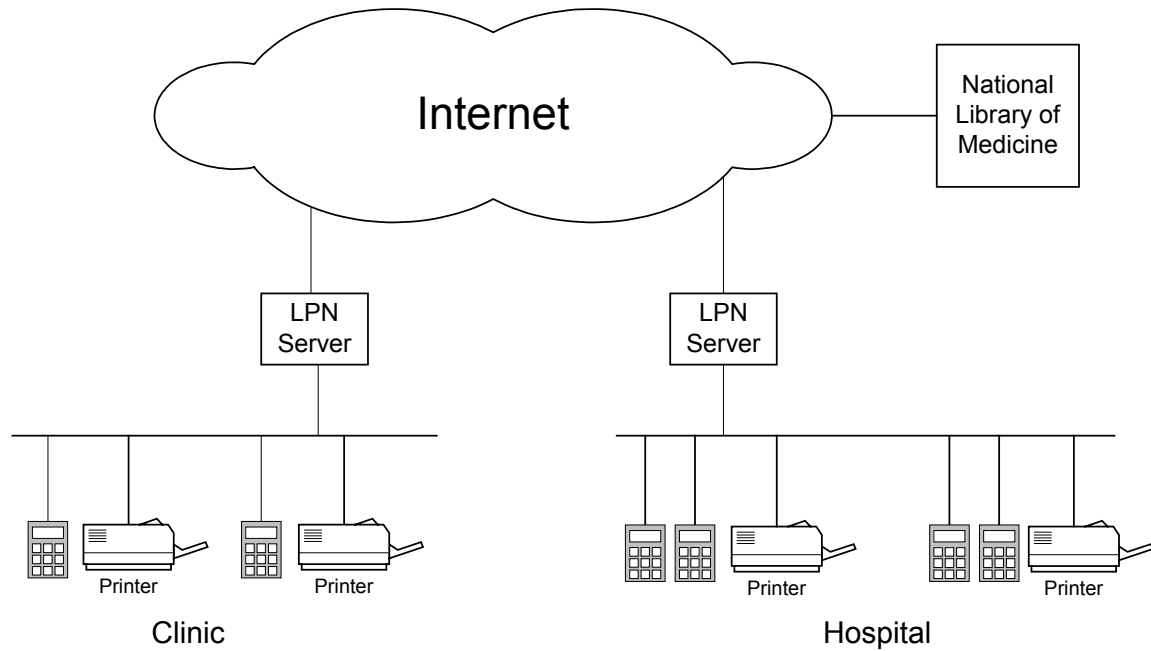
Benefit

- Instantly print account statements on demand, in offices, at homes or in service counters self-help

Case Study 4: Printing of Health Information

Help doctors to instantly provide health information for patients, families and friends in hospitals and clinics during consultations.

The user (patient, Eve) goes to see doctor in a clinic. Consultation is given, and the doctor finds a need of providing more health information to Eve to reduce her worry and tension, and help her to rehabilitate. However, the search of related information is time consuming. Alternatively, the doctor refers to a medical index pamphlet, selects and instantly prints the related information for Eve.



In the Health Information Center

1. Articles of useful medical information are collected and stored as files in a ftp server, and each file has a numeric file name, such as 10001 is the file name of the article [Understanding Cholesterol].
2. Pamphlets that include the titles and print numbers (file names) of these articles, such as [title: Understanding Cholesterol (10001)], are distributed to doctors.

Sample Pamphlet:

...	PN	About nausea and vomiting	10033
Understanding Cholesterol	10001	Gastroparesis and Diabetes	10034
...		H.pylori and Peptic Ulcer	10035
DIGESTIVE SYSTEM	10021	What I need to know about Peptic Ulcers	10036
Your Digestive System and How It Works?	10022	<u>Liver</u>	
Smoking and your Digestive System	10024	What I need to know about Hepatitis A	10041
Bleeding in the digestive Tract	10025	What I need to know about Hepatitis B	10042
Children and Digestive Problems	10026	What I need to know about Hepatitis C	10043
<u>Stomach</u>		Vaccination for Hepatitis A and B	10044
Stomach Ulcers	10031	Liver Function Tests	10045
Cyclic Vomiting Syndrome	10032	...	

For the Doctors in Clinics and Hospitals Worldwide

1. When the doctor thinks it is useful to provide more medical advices and instructions to the patient, the doctor relying on his medical knowledge refers to the pamphlet, and chooses a related article, such as Understanding Cholesterol
2. The doctor, on the keypad of the printer, keys in the index number (10001) of the chosen article
3. The printer downloads the article 10001 from the ftp server, and prints out the article, i.e. Understanding Cholesterol

Benefit

- Instantly print health information for almost every disease and up-to-date.
- Printed information for future reference by patients, families and friends after consultations.